

Ceramic Additive Manufacturing for Metal Casting

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The official link for this solicitation is:

<http://www.acq.osd.mil/osbp/sbir/solicitations/sbir20152/index.shtml>

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Topic Number:

DLA152-003

Description:

DLA seeks drastically lower unit costs and availability of cast parts support through manufacturing revolutions that also have applicability to low or high volume production from commercial sales. This will result in an improvement in the affordability of these innovations to DLA and its customers and the development of cost effective methods to sustain existing defense systems while a potential impact on the next generation of defense systems. The proposals must include and evaluations will review, in part, an economic analysis of the expected market impact of the technology proposed. This topic seeks a revolution in the reduction of unit cost metrics. Incremental advancements will receive very little consideration. DLA seeks herein only projects that are too risky for ordinary capital investment by the private sector. Manufacturing using ceramic cores or molds for metal casting processes, like investment casting, use conventional tooling that is typically expensive with long lead times. Ceramic Additive Manufacturing has become a more efficient way to manufacture cores and molds for some metal castings, including investment cast parts. The DLA desires to make Ceramic additive manufacturing a viable drop-in replacement in the manufacture and production cores and molds used for metal cast parts. PHASE I: Determine, insofar as possible, the scientific, technical and commercial feasibility of the idea. Include, where appropriate, a process technology roadmap for implementing promising approaches for near term insertion in support of Department of Defense (DoD) weapon systems, subsystems or component production. PHASE II: Develop applicable and feasible prototype demonstrations for the approach described, and demonstrate a degree of commercial viability. Validate the feasibility of the innovative ceramic additive manufacturing

process by demonstrating its use in the production, testing, and integration of items for the DLA. Validation would include, but not be limited to, system simulations, operation in test-beds, or operation in a demonstration system. A partnership with a current or potential supplier to the DLA is highly desirable. Identify any commercial benefit or application opportunities of the innovation. Firms should develop innovative processes with the intent to readily transition to production in support of the DLA and its supply chains. PHASE III: Technology transition via successful demonstration of a new process technology. This demonstration should show near-term application to one or more Department of Defense weapon systems, subsystems, or components. This demonstration should also verify the potential for enhancement of quality, reliability, performance and/or reduction of unit cost or total ownership cost of the proposed subject. Private Sector Commercial Potential: Ceramic additive manufacturing innovations for metal castings have a direct applicability to many defense weapon system technologies. New ceramic additive manufacturing technologies processes and systems for metal cast items have wide applicability to the defense industry including air, ground, sea, and weapons technologies. There is significant interest within the private sector industries as well as civilian sector relevance. Many of the technologies under this topic would be directly applicable to other DoD agencies, NASA, and many commercial manufacturing venues. Ceramic additive manufacturing innovations would directly improve production in the commercial sector resulting in reduced cost and improved productivity.